

Application No. 10/064,939
Docket No. 13DV-13676
Amendment dated January 23, 2004
Reply to Office Action of October 23, 2003

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (currently amended): A component comprising an outer coating having a fluorite cubic microstructure and consisting essentially of either a zirconia-based composition or a hafnia-based composition, the zirconia-based composition consisting ~~essentially~~ of zirconia and a stabilizer chosen from the group consisting of erbia, neodymia, and samarium oxide, the hafnia-based composition consisting essentially of hafnia and at least one stabilizer chosen from the group consisting of dysprosia, gadolinium oxide, samarium oxide, ~~yttria~~ and ytterbia and optionally a second stabilizer consisting of yttria.

Claim 2 (previously presented): A component according to claim 1, wherein the outer coating consists of one of the zirconia-based compositions.

Claim 3 (previously presented): A component according to claim 1, wherein the outer coating consists of zirconia stabilized by about 10 to about 25 atomic percent erbia.

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Claims 4 and 5 (cancelled)

Claim 6 (previously presented): A component according to claim 1, wherein the outer coating consists of zirconia stabilized by about 8 to about 22 atomic percent neodymia.

Claim 7 (currently amended): A component according to claim 1, wherein the outer coating consists ~~essentially~~ of zirconia stabilized by about 10 to about 25 atomic percent samarium oxide.

Claims 8 and 9 (cancelled)

Claim 10 (previously presented): A component according to claim 1, wherein the outer coating consists of one of the hafnia-based compositions.

Claim 11 (currently amended): A component according to claim 1, wherein the outer coating consists ~~essentially~~ of hafnia stabilized by about 10 to about 50 atomic percent dysprosia.

Claim 12 (currently amended): A component according to claim 1, wherein the outer coating consists ~~essentially~~ of hafnia stabilized by about 5 to about 30 atomic

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percent gadolinium oxide.

Claim 13 (currently amended): A component according to claim 1, wherein the outer coating consists ~~essentially~~ of hafnia stabilized by about 5 to about 30 atomic percent samarium oxide.

Claim 14 (currently amended): A component according to claim 1, wherein the outer coating consists of the hafnia-based composition and contains about 4 to about 5 weight percent yttria. ~~consists essentially of hafnia stabilized by about 10 to about 45 atomic percent yttria.~~

Claim 15 (currently amended): A component according to claim 1, wherein the outer coating consists ~~essentially~~ of hafnia stabilized by about 10 to about 50 atomic percent ytterbia.

Claim 16 (currently amended): A component according to claim 1, wherein the outer coating consists of hafnia, either is one of the hafnia-based compositions in which the stabilizer is dysprosia, gadolinium oxide, samarium oxide, or ytterbia as the stabilizer, and ~~the outer coating further contains about 4 to about 5 weight percent yttria.~~

Claim 17 (original): A component according to claim 1, further comprising a

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metallic bond coat adhering the outer coating to the component.

Claim 18 (original): A component according to claim 1, wherein the component is a superalloy airfoil component of a gas turbine engine.

Claim 19 (currently amended): A gas turbine engine component comprising:

a superalloy substrate;

a metallic bond coat on a surface of the substrate; and

a thermal barrier layer as an outermost coating of the component, the thermal barrier layer having columnar grains and a fluorite cubic microstructure, the thermal barrier layer consisting ~~essentially~~ of either a stabilized zirconia-based composition or a stabilized hafnia-based composition;

wherein the stabilized zirconia-based composition is chosen from the group consisting of zirconia stabilized with about 10 to about 25 atomic percent erbia, zirconia stabilized with about 8 to about 22 atomic percent neodymia, and zirconia stabilized with about 10 to about 25 atomic percent samarium oxide; and

wherein the stabilized hafnia-based composition is chosen from the group consisting of hafnia stabilized with about 10 to about 50 atomic percent dysprosia, hafnia stabilized with about 5 to about 30 atomic percent gadolinium oxide, hafnia stabilized with about 5 to about 30 atomic percent samarium oxide, ~~hafnia stabilized with about 10 to about 45 atomic percent yttria~~, or hafnia stabilized with about 10 to

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about 50 atomic percent ytterbia.

Claim 20 (cancelled)

Claim 21 (original): A gas turbine engine component according to claim 19, wherein the thermal barrier layer consists of zirconia stabilized by about 12 to about 25 atomic percent erbia.

Claim 22 (cancelled)

Claim 23 (original): A gas turbine engine component according to claim 19, wherein the thermal barrier layer consists of zirconia stabilized by about 8 to about 18 atomic percent neodymia.

Claim 24 (original): A gas turbine engine component according to claim 19, wherein the thermal barrier layer consists of zirconia stabilized by about 10 to about 20 atomic percent samarium oxide.

Claims 25 and 26 (cancelled)

Claim 27 (original): A gas turbine engine component according to claim 19,

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wherein the thermal barrier layer consists of hafnia stabilized by about 10 to about 45 atomic percent dysprosia.

Claim 28 (original): A gas turbine engine component according to claim 19, wherein the thermal barrier layer consists of hafnia stabilized by about 10 to about 25 atomic percent gadolinium oxide.

Claim 29 (original): A gas turbine engine component according to claim 19, wherein the thermal barrier layer consists of hafnia stabilized by about 10 to about 20 atomic percent samarium oxide.

Claim 30 (currently amended): A gas turbine engine component according to claim 19, wherein the outer coating consists of the hafnia-based composition and contains about 4 to about 5 weight percent yttria. ~~consists of hafnia stabilized by about 15 to about 40 atomic percent yttria.~~

Claim 31 (original): A gas turbine engine component according to claim 19, wherein the thermal barrier layer consists of hafnia stabilized by about 15 to about 25 atomic percent ytterbia.